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(54) Assembling a keypad to a mobile device

Anbringung einer Tastatur an eine mobile Vorrichtung

Assemblage d'un clavier sur un dispositif mobile

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Description

BACKGROUND

[0001] Mobile electronic devices are commonly integrated with keypads. The keypads allow users to type on the mobile electronic devices for inputting text, commands, etc. Although often of a similar configuration to a full sized keyboard, keypads for mobile devices present different construction and installation challenges, in part, because of their smaller scale and the smaller scale of the mobile device.

DESCRIPTION OF DRAWINGS

[0002]

FIG. 1A is a front view of a mobile device with a keypad according to the present disclosure.

FIG. 1B is a right side view of the mobile device of FIG. 1A according to the present disclosure.

FIG. 2 is a detail perspective view of the mobile device of FIG. 1A, partially assembled, depicting the keypad installed into a front frame according to the present disclosure.

FIG. 3 is a detail perspective view of the front frame of the mobile device of FIG. 1A according to the present disclosure.

FIG. 4 is a perspective view of a keypad according to the present disclosure.

FIG 5 is a perspective view of a base for the keypad according to the present disclosure.

FIG. 6 is a detail, end cross sectional view of the keypad of FIG. 4 installed in the front frame of the mobile device of FIG. 1A according to the present disclosure.

FIG. 7 is a detail perspective view of the mobile device of FIG. 1A showing an installation of the keypad of FIG. 4 and the base to the front frame according to the present disclosure.

FIGS. 8A and 8B are perspective views of a second example keypad according to the present disclosure.

[0003] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0004] According to an aspect, there is provided a method for assembling a mobile device as set out in claim 1.

[0005] According to an aspect, there is provided a mobile device as set out in claim 9.

[0006] FIG. 1A is a front view of a mobile device 100 with a keypad 160 according to the present disclosure. The mobile device 100 can be a cellular phone, including a smart phone, a dedicated personal digital assistant (PDA) with or without phone or data capabilities, an elec-

tronic reading device, a tablet computer, a digital media player, or any other mobile device having a keypad. In many instances, the terms "mobile device" and "hand held device" are interchangeable, both regarding to electronic devices available as information stores for personal contacts, calendar appointments, and the like. Additionally, many mobile devices wirelessly connect to the public Internet to allow for the sending and receiving of e-mail. Such mobile devices may also provide more general Internet access, such as access to the World Wide Web. For example, the mobile device 100 may be designed to operate with the General Packet Radio Service (GPRS) mobile data communication networks and may also be designed to operate with any of a variety of voice communication networks, such as AMPS, TDMA, CDMA, PCS, GSM, etc. Other types of data and voice networks, both separate and integrated, may also be utilized with the mobile device 100.

[0007] In certain instances, the mobile device 100 is a two-way RF communication device having voice and data communication capabilities. In addition, the mobile device 100 can have the capability to communicate with other mobile devices or computer systems via the Internet.

[0008] The mobile device 100 includes a front frame 110, a screen 120, a number of shortcut control buttons 140a-e, and a keypad 160. A forward facing surface 112 of the front frame 110 forms the forward facing surface of the mobile device 100. The front frame 110 includes a lower cover 170 for users to hold the mobile device 100 when the holding finger is not typing. A back cover 115 (shown in FIG. 1B) is attached to the back side of the front cover, and defines the back surface of the mobile device 100.

[0009] The front frame 110 cooperates with the back cover 115 to house inner components of the mobile device 100. The front frame 110 serves as an installation platform for user interface components of the mobile device 100. For example, the screen 120 and the short cut control buttons 140a-e are installed on top of the front frame 110.

[0010] The screen 120 can be both an input device (i.e., a touch sensitive device) and an output device (i.e., a display). In some embodiments, the screen 120 is a light emitting diode (LED) backlit liquid crystal display (LCD) with multi-touch control functions. Some of these features may be omitted in other examples. For example, the screen 120 may lack the multi-touch control functions, or the screen 120 may lack the LED backlit feature.

[0011] In some embodiments, the mobile device 100 may include additional features, such as a front camera 130.

[0012] The shortcut buttons 140a-e are dedicated buttons for specific functions in the mobile device 100. In some embodiments, the shortcut buttons may include more than one input mechanism. For example, the shortcut buttons can include pressure sensors and/or optical sensors for navigational up-down-left-right input. In cer-

tain instances, the shortcut buttons can activate a specific operation mode of the mobile device, such as a mode for cellular phone, a mode for applications, a mode for internet browsing, etc. The illustrated shortcut buttons 140a-e are separated from the keypad 160; however, in some embodiments, the shortcut buttons 140a-e can be integrated into the keypad 160. In certain instances, the shortcut buttons 140a-e could alternately or additionally be implemented as virtual buttons on a touchscreen display.

[0013] The front frame 110 is generally planar and rectangular in shape, and defines openings in its forward facing surface 112 to receive the screen 120, the shortcut buttons 140a-e and the keys of the keypad 160. The front frame 110 has frets 150 (four shown, but fewer or more could be provided) that span laterally between the left and right sides of the front frame 110 to define elongate key receiving openings 155. The key receiving openings 155 receive rows of keys of the keypad 160. The frets 150 separate the multiple rows of the keys of the keypad 160. In certain instances, the width of each fret 150 would allow a user's thumbs pressing down a key without pressing down keys in neighboring rows.

[0014] FIG. 1B is the side view of the mobile device 100 according to the present disclosure. This perspective shows that the keypad 160 can include a side key 190 installed on the sidewall of the mobile device 100. Although in this illustration there is only one side key 190 associated with the keypad 160, in some embodiments, there can be two or more side keys integrated with the keypad 160.

[0015] FIG. 2 is a perspective view of the keypad 160 installed into the front frame 110 according to the present disclosure. Certain components are omitted in this view to show the structure of the front frame 110. For example, the screen, the lower cover, the back cover and the side key cover are omitted in this view. As illustrated, the front frame 110 can include a vertically upstanding sidewall 200 on its outer perimeter. A side key mechanism 220 extends through a side key opening 320 of the sidewall 200. Of note, the keys 165 of the keypad 160 extend to the edges of the device, so that the side edges of the keys are flush (substantially flush as shown, or completely flush) with the outward facing surface of the sidewall 200. The forward facing surfaces of the keys 165 are also flush (substantially flush as shown, or completely flush) with the forward facing surface 112 of the front frame 110.

[0016] FIG. 3 is a perspective view of the front frame 110 of the mobile electronic device 100 according to the present disclosure. In this view only the front frame 110 is displayed. At the forward facing surface 112 of the front frame 110, the key openings 155 span the entire width of the front frame 110 - from the outer surface of the sidewall 200 on one side of the device to the opposing outer surface of the sidewall 200 on the other side of the device. Back from the forward facing surface 112 (i.e., in a direction towards the back cover 115 of the device 100), however, the key openings 155 span between the inner

surfaces of the sidewall 200, and define forward facing edge surfaces 330 atop the sidewall 200. The screen opening 340 for the screen 120 has a similar configuration. As previously described above, the side key opening 320 for the side key 190, as shown in FIGS. 1A and 1B, is also provided in the sidewall 200.

[0017] FIG. 4 is a perspective view of the keypad 160 according to the present disclosure. The keypad 160 includes a number of keys 165 distributed in a keyboard layout. The keyboard layout can be ISO/IEC 9995 or similar. In some embodiments, the keyboard layout can be other than the ISO/IEC 9995 standard and tailored to specific purposes. The keys 165 can be rigid, made of a hard material such as plastic, metal, or other material. The forward facing surface of the keys 165 is flat and/or shaped to accommodate the human fingers, so as to be easily depressed, pushed, or recognized.

[0018] The keys 165 along the right and left side edges of the keypad 160 are those that, as described with respect to FIG. 2, extend to the side edges of the device. The keys 165 along the right and left side edges of the keypad 160 can, as shown, also include anti-pick flanges 450 that protrude from the top and bottom of each key 165 along the right and left side edges of the keypad. When installed in the front frame, the anti-pick flanges 450 abut the back side of adjacent front frame frets 150 and block the keys 165 from being lifted forward, i.e. picked, off the keypad 160. In certain instances, the anti-pick flanges 450 can mate with corresponding receptacles 452 (FIG. 3) in the back surface of the frets 150. Also of note, additional keys 165 can be provided with the anti-pick flanges 450.

[0019] The keypad 160 includes a backing 401 that carries the keys 165. The backing 401 includes a flexible sheet onto which the keys are affixed and a frame 440 that forms a grid behind the keys 165 to support the flexible sheet. The frame 440 has a bottom 441, a top 443, and opposing sides 445, and forms the perimeter of the backing 401. The keys 165 at the sides 445 of the keypad 160 extend over, i.e. overhang, the sides 445, thereby enabling the sides 445 of the keys 165 at the left and right side edges of the keypad to be substantially flush with the sidewalls 200 of the device 100. The backing 401 can be constructed of elastically bendable materials that enable the backing 401 to be deformed between a laterally extended state (shown in FIG. 4) and a laterally contracted state where, as will be described in more detail below, the keypad 160 can be inserted through the back of the front frame for assembly of the keypad 160 to the mobile device.

[0020] In some embodiments, the frame 440 is made of materials that are of different levels of transparency. For example, the frame 440 includes transparent sections 420 and opaque sections 430. The transparent sections 420 are positioned directly behind the keys 165 to transmit light from a back light (not shown) to illuminate the keys 165. The opaque sections 430 are positioned between adjacent rows of keys 165 to block light from

the back light, and thus prevent light bleed around the keys 165. The transparent sections 420 and the opaque sections 430 can be arranged into parallel strips spanning between the sides 445 of the backing 401 to distribute light evenly to the keys 165. The transparent sections 402 can span to the perimeter of the backing 401 to facilitate lighting the edge most keys 165. The backing 401 additionally includes an opaque light shield 410 behind the keys 165 to control the distribution of light.

[0021] FIG 5 is a perspective back side view of a generally planar base 500 for the keypad 160 according to the present disclosure. The base 500 can include a number of different layers forming an elastically bendable structure. In general, however, the base 500 has a flexible printed circuit board that integrates various electrical circuits that convert movement of keys 165 into electrical signals that can be received by a processor (not shown) of the mobile device 100. The electrical circuits are connected to other components of the mobile device via connectors 540. The base 500 includes a metal stiffening assembly 520, which includes a number of metal layers that stiffen the base 500 to support against key presses. The base 500, however, is also flexible enough to elastically deform between a laterally extended state (shown in FIG. 5) and a laterally contracted state where, as will be described in more detail below, the base 500 can be inserted through the back of the front frame 110 for assembly of the base 500 to the mobile device 100. The stiffening assembly 520 also includes a side key support 510 that projects orthogonally (substantially orthogonally as shown, or precisely orthogonally) to the remainder of the base 500 and serves as an attachment and support for the side key assembly 220.

[0022] FIG. 6 is a cross section view of the keypad 160 and base 500 installed in the front frame 110 according to the present disclosure. The front frame 110 defines an installation space 710 for receiving the keypad 160 and the base 500. The keypad 160 and base 500 are beneath base retaining shoulders 714 formed on the inner wall of the front frame 110. A flexible spacer 550, for example made of foam or another material, abuts the shoulder 714 and retains the keypad 160 and base 500 in position with the keypad 160 abutting the back side of the front frame 110. The flexible sheet 712 of keypad backing 401 is shown with frustaconical key springs 720 formed into the sheet behind each of the keys 165. The flexible sheet 712 can be made of resilient material, such as silicone rubber or other material, so that the key springs 720 compress and springingly return the keys 165 in response to key presses. A key dome and circuit assembly 740 includes the printed circuit board (e.g., composite material coated with circuitry) and key domes that translate movement of the keys, i.e., key presses, into electrical signals.

[0023] Turning now to FIG. 7 with occasional reference to FIGS. 1-6, the operator/machine performing the installation process receives the keypad 160 of the mobile device 100 oriented (or orients it) with the keys 165 toward the back side of the front frame 110. The keypad 160 is

elastically deformed into a laterally contracted state, with the backing 401 of keypad 160 bent into an arced or curved shape similar to the arced shape of the base 500 shown in FIG. 7. In the laterally contracted state, the greatest distance, measured linearly across the keypad 160, between the outer side edges of the left and right most edge keys 165 is less than the smallest distance the keypad 160 must pass through to position the keys 165 in the opening 155. In certain instances, that smallest distance is the distance between the innermost edges of the left and right front facing edge surfaces 330 (FIG. 3). In other instances, the inner surface of the front frame 110 may have other features, such as the base retaining shoulders 714, that protrude laterally inward and that the keys 165 must pass.

[0024] The keys 165 on one edge of the keypad 160 are inserted from behind the front frame 110 of the mobile device 100 through the opening 155, such that the keys 165 overhang the corresponding front facing edge surface 330. For example, keys 165 on the right side edge of the keypad 160 can be inserted through the opening 155 and positioned to overhang the right side front facing edge surface 330. The keypad 160 can then be pivoted down to insert the keys 165 on the opposing edge through the opening 155. In the example where the keys 165 on the right side edge of the keypad 160 were initially inserted through the opening 155, the keypad 160 is pivoted down to insert the keys 165 on the left side edge of the keypad 160 through the opening 155. When the keypad 160 is released from the laterally contracted state, it elastically returns to a laterally expanded state, and the keys 165 pivoted through the opening 155 move laterally over and in front of the front facing edge surface 330. The result is that both the keys 165 on the left side edge and the right side edge of the keypad 160 are positioned in front of the left and right front facing edge surface 330 (see FIG. 2).

[0025] Installation of the base 500 is similar. The operator/machine performing the installation process receives the base 500 oriented (or orients it) with its front surface toward the back side of the front frame 110. The base 500 is elastically deformed into a laterally contracted state as shown in FIG. 7, with the base 500 bent into an arced or curved shape, and positioned behind the key top 160. In the laterally contracted state, a side edge of the base 500 can be positioned under the corresponding base retaining shoulder 714, and the base 500 pivoted down passing the opposing base retaining shoulder 714 to abut the keypad 160. In instances where the base 500 includes a side key assembly 220 (see FIG. 2), the side key assembly 220 can be placed through the side key opening 320, and then the base 500 pivoted down to abut the keypad 160. When the base 500 is released from the laterally contracted state, it elastically returns to a laterally expanded state. In the laterally expanded state, the left and right edges of the base 500 are adjacent the inner surface of the front frame 110 and positioned under the right and left side retaining shoulders 714 (see FIG. 6).

[0026] In certain instances, the keypad 160 and base 500 can be inserted into front frame 110 together. For example, the keypad 160 and base 500 can be held together in their respective laterally contracted states, positioned in the front frame 110 together, then allowed to return to their laterally expanded states.

[0027] FIGS. 8A and 8B are perspective, back side views of a second example keypad 800 according to the present disclosure. Like the keypad 160 described above, the keypad 800 has rigid keys and a backing 810 with a flexible sheet 820 onto which the keys are affixed. A frame 830 forms a grid behind the keys to support the flexible sheet 820. The frame 810, however, need not be elastically bendable like the frame 440 to fit into the front frame of the mobile device. Rather, the keypad 800 includes a plurality of separable sections - three shown (right 800a, middle 800b, and left 800c) - that can be disassembled and individually placed in the front frame of the mobile device. As they are placed in the mobile device, they are assembled together to a laterally expanded state with alignment features 840 and locking features 850 shown in FIG. 8B. The alignment features 840 and locking features 850 can be male-female couplings of various geometric shapes. In the embodiment shown in FIG. 8B, the alignment features 840 have a male protrusion that can be laterally inserted into the female receptacle of the adjacent section. The locking features 850 have a male protrusion with a generally circular shape that locks into a corresponding generally circular female receptacle of an adjacent section to retain the sections against laterally separating. In other instances, fewer or more sections could be provided.

[0028] The elastically bendable keypad and manner of construction described herein allows construction of a mobile device to have keys that overlap features of the front facing frame of the device, and in certain instances keys that extend to the edges of the device. The segmented keypad and manner of construction allows similar features. If provided, the anti-pick flanges retain the keys to the frame, even though the keys are in front of features of the frame.

[0029] A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made. Accordingly, other implementations are within the scope of the following claims.

Claims

1. A method for assembling a mobile device (100), wherein the mobile device (100) comprises a vertically upstanding sidewall (200) on its outer perimeter, the method comprising:

receiving a keypad (160) of the mobile device (100), the keypad (160) having a first key at a first edge of the keypad (160) and a second key at a second edge of the keypad (160);

inserting, from behind a front frame (110) of the mobile device (100), the first key into an opening in the front frame (110); and
positioning the keypad (160) with the first key in front of a first forward facing surface of the front frame (110) and the second key in front of a second forward facing surface of the front frame (110) such that a side edge of the first key and a side edge of the second key are substantially flush with an outward facing surface of the sidewall (200), and a forward facing surface of the first key and a forward facing surface of the second key are substantially flush with the forward facing surface of the front frame (110), the positioning being performed by:

expanding the keypad (160) from a laterally contracted state, where the keypad (160) is elastically compressed, to a laterally expanded state; or
assembling the keypad (160) from a plurality of separable sections (800a, 800b, 800c), wherein a first of the separable sections comprises the first key and a second of the separable sections comprises the second key.

2. The method of claim 1, where the first key and the second key are rigid and coupled to a backing (401) that is elastically bendable between:

the laterally contracted state, where a greatest linear distance between outer side edges of the first key and the second key is less than a smallest linear distance between the first forward facing surface and the second forward facing surface; and
the laterally expanded state, where a greatest linear distance between the outer side edges of the first key and the second key is greater than the smallest linear distance between the first forward facing surface and the second forward facing surface.

3. The method of claim 1 or 2, where the first key and the second key are rigid and coupled to a backing (401) that is elastically bendable; and
where positioning the keypad (160) with the first key in front of a first forward facing surface of the front frame (110) and the second key in front of a second forward facing surface of the front frame (110) by expanding the keypad laterally further comprises positioning the keypad (160) with the backing (110) behind the first and second forward facing surfaces.
4. The method of claim 1, where the keypad (160) comprises a plurality of separable sections, the method further comprising assembling the second section of

the keypad (160) to the first second of the keypad by inserting a male alignment feature of the first section into a female alignment feature of the second section.

5. The method of any preceding claim, where the first forward facing surface is adjacent an outer sidewall (200) on a first side of the mobile device (100) and the second forward facing surface is adjacent an outer sidewall (200) on a second side of the mobile device (100), opposite the first side.

6. The method of any preceding claim, where the first key and the second key are coupled to a backing (401, 810), the perimeter of the backing having transparent sections proximate the first key and the second key and opaque sections.

7. The method of any preceding claim, where inserting, from behind a front frame (110) of the mobile device, the first key into an opening in the front frame (110) comprises inserting, from behind the front frame (110) of the mobile device (100), the first key into an opening in a front surface of the front frame (110); and where the method further comprises inserting, from behind the front frame (110) of the mobile device (100), a third key into an opening in a sidewall (200) of the front frame (110).

8. The method of any preceding claim, where inserting, from behind a front frame (110) of the mobile device (100), the first key into an opening in the front frame (110) comprises inserting, from behind the front frame (110) of the mobile device (100), the first key into an opening in the front frame (110) with an outwardly extending anti-pick flange (450) of the first key behind the front frame (110).

9. A mobile device (100), comprising:

a vertically upstanding sidewall (200) on its outer perimeter;

a front frame (110) having a key opening, a first forward facing surface adjacent the key opening and a second forward facing surface adjacent the key opening; and

a keypad (160) having a first key coupled to a keypad backing at a first edge of the keypad (160) and a second key coupled to the backing at a second edge of the keypad (160), the keypad (160) insertable from behind the front frame (110) of the mobile device according to the method of any preceding claim, such that a side edge of the first key and a side edge of the second key are substantially flush with an outward facing surface of the sidewall (200), and a forward facing surface of the first key and a forward facing surface of the second key are substantially

flush with the forward facing surface of the front frame (110).

10. The mobile device (100) of claim 9, where the keypad backing (401) comprises an elastically bendable keypad backing (401) that is compressible between:

a laterally extended state where the first key is in front of the first forward facing surface and the second key is in front of the second forward facing surface; and

a laterally contracted state where a greatest linear distance between outer side edges of the first key and the second key is less than the smallest linear distance between the first forward facing surface and the second forward facing surface.

11. The mobile device of claim 9, where the keypad (160) comprises a plurality of separable sections (800a, 800b, 800c), the plurality of separable sections comprising a first section carrying the first key and a second section carrying the second key, wherein the first and second sections are assembled together with male-female couplings.

12. The mobile device (100) of claim 9, where the front frame (110) resides between the first key and the keypad backing (401, 810) and between the second key and the keypad backing (401, 801).

Patentansprüche

1. Verfahren zum Zusammenbauen einer mobilen Vorrichtung (100), wobei die mobile Vorrichtung (100) eine vertikal aufrechte Seitenwand (200) an ihrem äußeren Umfang aufweist, wobei das Verfahren aufweist:

Aufnehmen einer Tastatur (160) der mobilen Vorrichtung (100), wobei die Tastatur (160) eine erste Taste an einem ersten Rand des Tastatur (160) und eine zweite Taste an einem zweiten Rand der Tastatur (160) hat;

Einfügen, von der Rückseite eines vorderen Rahmens (110) der mobilen Vorrichtung (100), der ersten Taste in eine Öffnung in dem vorderen Rahmen (110); und

Positionieren der Tastatur (160) mit der ersten Taste vor einer ersten, nach vorne zugewandten Oberfläche des vorderen Rahmens (110) und der zweiten Taste vor einer zweiten, nach vorne zugewandten Oberfläche des vorderen Rahmens (110) derart, dass eine Seitenkante der ersten Taste und eine Seitenkante der zweiten Taste im Wesentlichen bündig sind mit einer nach außen zugewandten Oberfläche der Sei-

tenwand (200), und
eine nach vorne zugewandte Oberfläche der ersten Taste und eine nach vorne zugewandte Oberfläche der zweiten Taste im Wesentlichen bündig sind mit der nach vorne zugewandten Oberfläche des vorderen Rahmens (110), wobei das Positionieren durchgeführt wird durch:

Aufweiten der Tastatur (160) aus einem lateral zusammengezogenen Zustand, wobei die Tastatur (160) elastisch komprimiert ist, in einen lateral aufgeweiteten Zustand; oder Zusammenbauen der Tastatur (160) aus einer Vielzahl von trennbaren Abschnitten (800a, 800b, 800c), wobei ein erster der trennbaren Abschnitte die erste Taste aufweist und ein zweiter der trennbaren Abschnitte die zweite Taste aufweist.

2. Das Verfahren gemäß Anspruch 1, wobei die erste Taste und die zweite Taste starr sind und mit einem Träger (401) gekoppelt sind, der elastisch biegsam ist zwischen:

dem lateral zusammengezogenen Zustand, in dem ein größter linearer Abstand zwischen äußeren Seitenkanten der ersten Taste und der zweiten Taste geringer ist als ein kleinster linearer Abstand zwischen der ersten nach vorne zugewandten Oberfläche und der zweiten nach vorne zugewandten Oberfläche; und
dem lateral aufgeweiteten Zustand, in dem ein größter linearer Abstand zwischen den äußeren Seitenkanten der ersten Taste und der zweiten Taste größer ist als der kleinste lineare Abstand zwischen der ersten nach vorne zugewandten Oberfläche und der zweiten nach vorne zugewandten Oberfläche.

3. Das Verfahren gemäß Anspruch 1 oder 2, wobei die erste Taste und die zweite Taste starr sind und mit einem Träger (401) gekoppelt sind, der elastisch biegsam ist; und
wobei das Positionieren der Tastatur (160) mit der ersten Taste vor einer ersten, nach vorne zugewandten Oberfläche des vorderen Rahmens (110) und der zweiten Taste vor einer zweiten, nach vorne zugewandten Oberfläche des vorderen Rahmens (110) durch laterales Aufweiten der Tastatur weiter aufweist ein Positionieren der Tastatur (160) mit dem Träger (110) hinter den ersten und zweiten, nach vorne zugewandten Oberflächen.
4. Das Verfahren gemäß Anspruch 1, wobei die Tastatur (160) eine Vielzahl von trennbaren Abschnitten aufweist, wobei das Verfahren weiter aufweist ein Zusammenbauen des zweiten Abschnitts der Tastatur (160) mit dem ersten Abschnitt der Tastatur

durch Einfügen eines Einfügen-Ausrichtungsmerkmals des ersten Abschnitts in ein Aufnahme-Ausrichtungsmerkmal des zweiten Abschnitts.

5. Das Verfahren gemäß einem vorhergehenden Anspruch, wobei die erste nach vorne zugewandte Oberfläche angrenzend an eine äußere Seitenwand (200) an einer ersten Seite der mobilen Vorrichtung (100) ist und die zweite nach vorne zugewandte Oberfläche angrenzend an eine äußere Seitenwand (200) an einer zweiten Seite der mobilen Vorrichtung (100) ist, entgegengesetzt zu der ersten Seite.
6. Das Verfahren gemäß einem vorhergehenden Anspruch, wobei die erste Taste und die zweite Taste mit einem Träger (401, 810) gekoppelt sind, wobei der Umfang des Trägers transparente Abschnitte in der Nähe der ersten Taste und der zweiten Taste und lichtundurchlässige Abschnitte hat.
7. Das Verfahren gemäß einem vorhergehenden Anspruch, wobei das Einfügen, von der Rückseite eines vorderen Rahmens (110) der mobilen Vorrichtung, der ersten Taste in eine Öffnung in dem vorderen Rahmen (110) aufweist ein Einfügen, von der Rückseite des vorderen Rahmens (110) der mobilen Vorrichtung (100), der ersten Taste in eine Öffnung in einer vorderen Oberfläche des vorderen Rahmens (110); und
wobei das Verfahren weiter aufweist ein Einfügen, von der Rückseite des vorderen Rahmens (110) der mobilen Vorrichtung (100), einer dritten Taste in eine Öffnung in einer Seitenwand (200) des vorderen Rahmens (110).
8. Das Verfahren gemäß einem vorhergehenden Anspruch, wobei das Einfügen, von der Rückseite eines vorderen Rahmens (110) der mobilen Vorrichtung (100), der ersten Taste in eine Öffnung in dem vorderen Rahmen (110) aufweist ein Einfügen, von der Rückseite des vorderen Rahmens (110) der mobilen Vorrichtung (100), der ersten Taste in eine Öffnung in dem vorderen Rahmen (110) mit einer sich nach außen erstreckenden Anti-Picking-Flansch (450) der ersten Taste hinter dem vorderen Rahmen (110).
9. Eine mobile Vorrichtung (100), die aufweist:
eine vertikal aufrechte Seitenwand (200) an ihrem äußeren Umfang;
einen vorderen Rahmen (110) mit einer Tastenöffnung, einer ersten nach vorne zugewandten Oberfläche angrenzend an die Tastenöffnung und einer zweiten nach vorne zugewandten Oberfläche angrenzend an die Tastenöffnung; und
ein Tastatur (160) mit einer ersten Taste, die mit einem Tastaturträger an einem ersten Rand der

Tastatur (160) gekoppelt ist, und einer zweiten Taste, die mit dem Träger an einem zweiten Rand der Tastatur (160) gekoppelt ist, wobei die Tastatur (160) von der Rückseite des vorderen Rahmens (110) der mobilen Vorrichtung (100) gemäß dem Verfahren nach einem vorhergehenden Anspruch eingefügt werden kann derart, dass eine Seitenkante der ersten Taste und eine Seitenkante der zweiten Taste im Wesentlichen bündig sind mit einer nach außen zugewandten Oberfläche der Seitenwand (200), und eine nach vorne zugewandte Oberfläche der ersten Taste und eine nach vorne zugewandte Oberfläche der zweiten Taste im Wesentlichen bündig sind mit der nach vorne zugewandten Oberfläche des vorderen Rahmens (110).

10. Die mobile Vorrichtung (100) gemäß Anspruch 9, wobei der Tastaturträger (401) einen elastisch biegsamen Tastaturträger (401) aufweist, der komprimierbar ist zwischen:

einem lateral aufgeweiteten Zustand, in dem die erste Taste vor der ersten nach vorne zugewandten Oberfläche ist und die zweite Taste vor der zweiten nach vorne zugewandten Oberfläche ist; und

einem lateral zusammengezogenen Zustand, in dem ein größter linearer Abstand zwischen äußeren Seitenkanten der ersten Taste und der zweiten Taste geringer ist als der kleinste lineare Abstand zwischen der ersten nach vorne zugewandten Oberfläche und der zweiten nach vorne zugewandten Oberfläche.

11. Die mobile Vorrichtung gemäß Anspruch 9, wobei die Tastatur (160) eine Vielzahl von trennbaren Abschnitten (800a, 800b, 800c) aufweist, wobei die Vielzahl von trennbaren Abschnitten einen ersten Abschnitt, der die erste Taste trägt, und einen zweiten Abschnitt aufweist, der die zweite Taste trägt, wobei die ersten und zweiten Abschnitte durch Einfügen-Aufnehmen-Kopplungen miteinander verbunden sind.

12. Die mobile Vorrichtung (100) gemäß Anspruch 9, wobei sich der vordere Rahmen (110) zwischen der ersten Taste und dem Tastenträger (401, 810) und zwischen der zweiten Taste und dem Tastenträger (401, 801) befindet.

Revendications

1. Procédé pour assembler un dispositif mobile (100), le dispositif mobile (100) comprenant une paroi latérale dressée verticalement (200) sur son périmètre externe, le procédé comprenant les étapes consis-

tant à :

recevoir un clavier (160) du dispositif mobile (100), le clavier (160) comportant une première touche au niveau d'un premier bord du clavier (160) et une deuxième touche au niveau d'un deuxième bord du clavier (160) ;
insérer, depuis l'arrière d'un châssis avant (110) du dispositif mobile (100), la première touche dans une ouverture dans le châssis avant (110) ;
et
positionner le clavier (160) avec la première touche devant une première surface tournée vers l'avant du châssis avant (110) et la deuxième touche devant une deuxième surface tournée vers l'avant du châssis avant (110) de manière qu'un bord latéral de la première touche et un bord latéral de la deuxième touche soient sensiblement de niveau avec une surface tournée vers l'extérieur de la paroi latérale (200), et une surface tournée vers l'avant de la première touche et une surface tournée vers l'avant de la deuxième touche soient sensiblement de niveau avec la surface tournée vers l'avant du châssis avant (110), le positionnement étant réalisé par :

expansion du clavier (160) d'un état contracté latéralement, dans lequel le clavier (160) est comprimé élastiquement, à un état expansé latéralement ; ou
assembler le clavier (160) à partir d'une pluralité de sections séparables (800a, 800b, 800c), une première des sections séparables comprenant la première touche et une deuxième des sections séparables comprenant la deuxième touche.

2. Procédé selon la revendication 1, dans lequel la première touche et la deuxième touche sont rigides et accouplées à un support (401) qui est flexible élastiquement entre :

l'état contracté latéralement, dans lequel une plus grande distance linéaire entre des bords latéraux externes de la première touche et la deuxième touche est inférieure à une plus petite distance linéaire entre la première surface tournée vers l'avant et la deuxième surface tournée vers l'avant ; et

l'état expansé latéralement, dans lequel une plus grande distance linéaire entre les bords latéraux externes de la première touche et la deuxième touche est supérieure à la plus petite distance linéaire entre la première surface tournée vers l'avant et la deuxième surface tournée vers l'avant.

3. Procédé selon la revendication 1 ou 2, dans lequel

la première touche et la deuxième touche sont rigides et accouplées à un support (401) qui est flexible élastiquement ; et

le positionnement du clavier (160) avec la première touche devant une première surface tournée vers l'avant du châssis avant (110) et la deuxième touche devant une deuxième surface tournée vers l'avant du châssis avant (110) par expansion du clavier latéralement comprend, en outre, le positionnement du clavier (160) avec le support (110) derrière les première et deuxième surfaces tournées vers l'avant.

4. Procédé selon la revendication 1, dans lequel le clavier (160) comprend une pluralité de sections séparables, le procédé comprenant, en outre, l'assemblage de la deuxième section du clavier (160) avec la première section du clavier par insertion d'un élément d'alignement mâle de la première section dans un élément d'alignement femelle de la deuxième section.
5. Procédé selon l'une quelconque des revendications précédentes, dans lequel la première surface tournée vers l'avant est adjacente à une paroi latérale externe (200) sur un premier côté du dispositif mobile (100) et la deuxième surface tournée vers l'avant est adjacente à une paroi latérale externe (200) sur un deuxième côté du dispositif mobile (100), opposé au premier côté.
6. Procédé selon l'une quelconque des revendications précédentes, dans lequel la première touche et la deuxième touche sont accouplées à un support (401, 810), le périmètre du support comportant des sections transparentes à proximité de la première touche et de la deuxième touche et des sections opaques.
7. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'insertion, depuis l'arrière d'un châssis avant (110) du dispositif mobile, de la première touche dans une ouverture dans le châssis avant (110) comprend l'insertion, depuis l'arrière du châssis avant (110) du dispositif mobile (100), de la première touche dans une ouverture dans une surface avant du châssis avant (110) ; et le procédé comprenant, en outre, l'insertion, depuis l'arrière du châssis avant (110) du dispositif mobile (100), d'une troisième touche dans une ouverture dans une paroi latérale (200) du châssis avant (110).
8. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'insertion, depuis l'arrière d'un châssis avant (110) du dispositif mobile (100), de la première touche dans une ouverture dans le châssis avant (110) comprend l'insertion, depuis l'arrière du châssis avant (110) du dispositif mobile

(100), de la première touche dans une ouverture dans le châssis avant (110) avec un rebord anti-arachage s'étendant vers l'extérieur (450) de la première touche derrière le châssis avant (110).

9. Dispositif mobile (100), comprenant :

une paroi latérale dressée verticalement (200) sur son périmètre externe ;
un châssis avant (110) comportant une ouverture de touche, une première surface tournée vers l'avant adjacente à l'ouverture de touche et une deuxième surface tournée vers l'avant adjacente à l'ouverture de touche ; et
un clavier (160) comportant une première touche accouplée à un support de clavier au niveau d'un premier bord du clavier (160) et une deuxième touche accouplée au support au niveau d'un deuxième bord du clavier (160), le clavier (160) étant apte à être inséré depuis l'arrière du châssis avant (110) du dispositif mobile suivant le procédé selon l'une quelconque des revendications précédentes, de manière qu'un bord latéral de la première touche et un bord latéral de la deuxième touche soient sensiblement de niveau avec une surface tournée vers l'extérieur de la paroi latérale (200), et une surface tournée vers l'avant de la première touche et une surface tournée vers l'avant de la deuxième touche soient sensiblement de niveau avec la surface tournée vers l'avant du châssis avant (110).

10. Dispositif mobile (100) selon la revendication 9, dans lequel le support de clavier (401) consiste en un support de clavier flexible élastiquement (401) qui est compressible entre :

un état expansé latéralement dans lequel la première touche est située devant la première surface tournée vers l'avant et la deuxième touche est située devant la deuxième surface tournée vers l'avant ; et
un état contracté latéralement dans lequel une plus grande distance linéaire entre des bords latéraux externes de la première touche et la deuxième touche est inférieure à la plus petite distance linéaire entre la première surface tournée vers l'avant et la deuxième surface tournée vers l'avant.

11. Dispositif mobile selon la revendication 9, dans lequel le clavier (160) comprend une pluralité de sections séparables (800a, 800b, 800c), la pluralité de sections séparables comprenant une première section supportant la première touche et une deuxième section supportant la deuxième touche, les première et deuxième sections étant assemblées l'une à l'autre au moyen d'accouplements mâle-femelle.

12. Dispositif mobile (100) selon la revendication 9, dans lequel le châssis avant (110) réside entre la première touche et le support de clavier (401, 810) et entre la deuxième touche et le support de clavier (401, 810).

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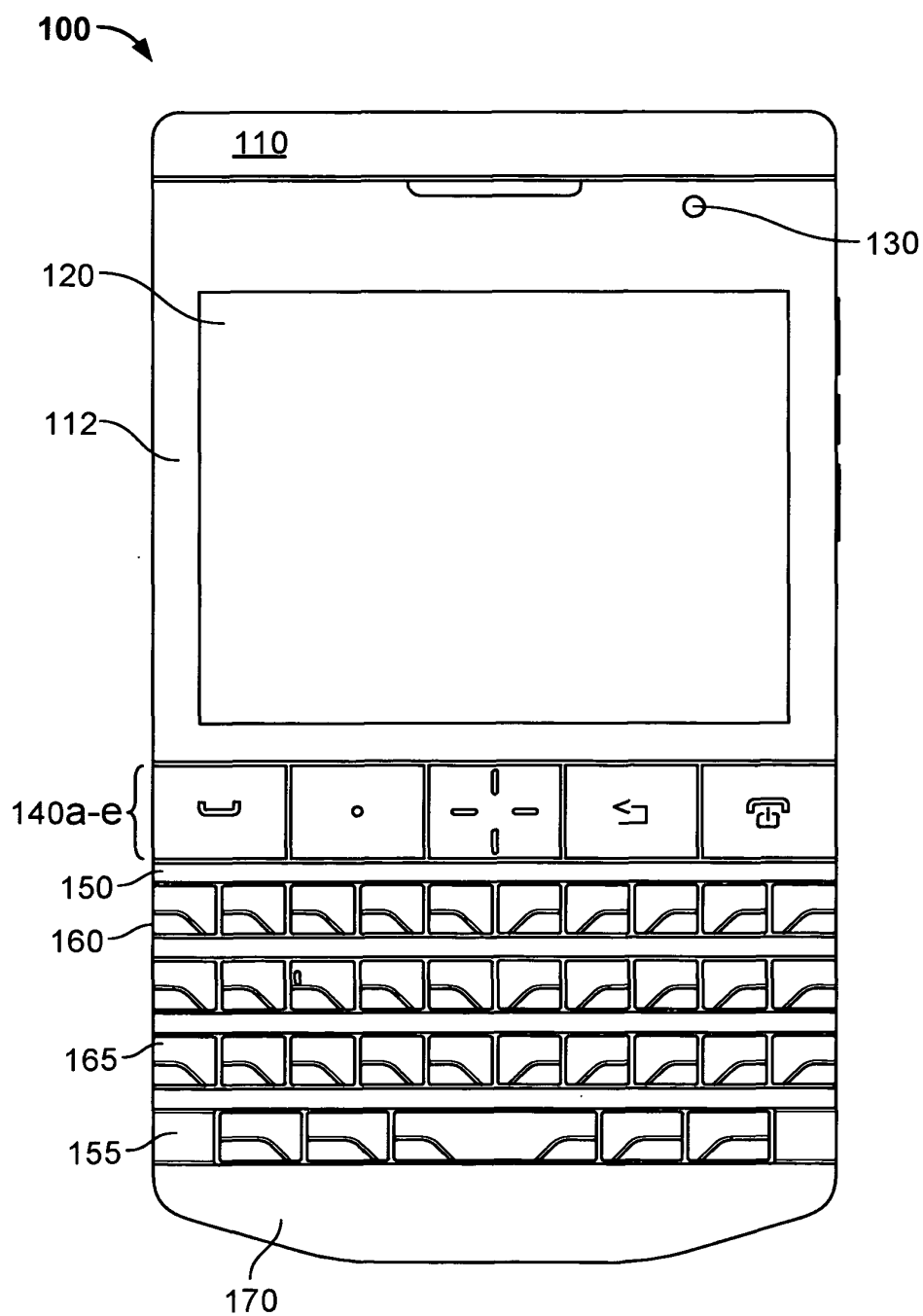


FIG. 1A

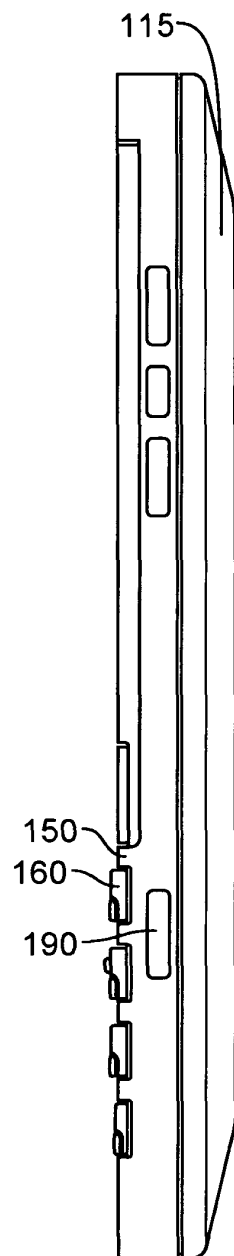


FIG. 1B

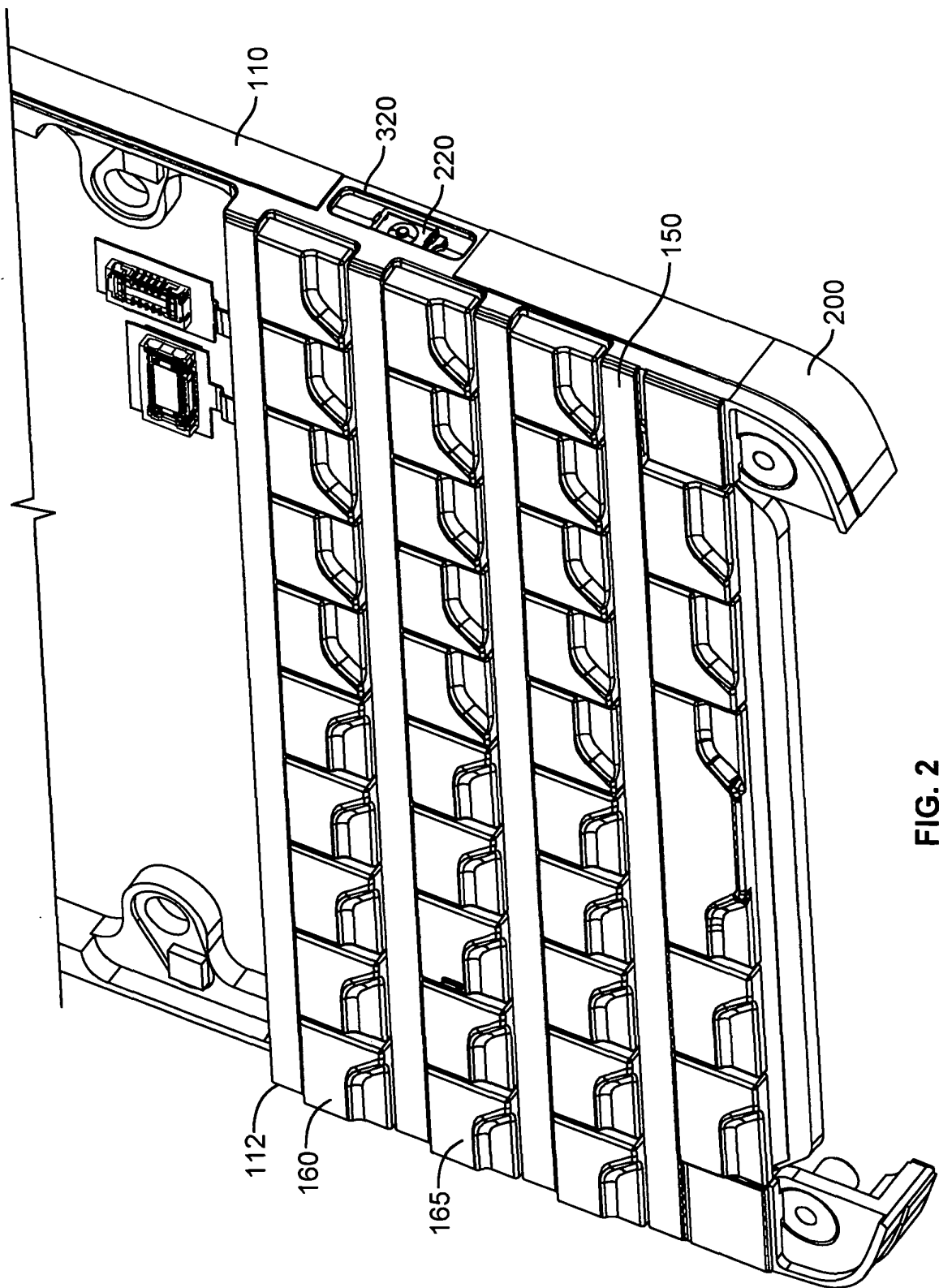
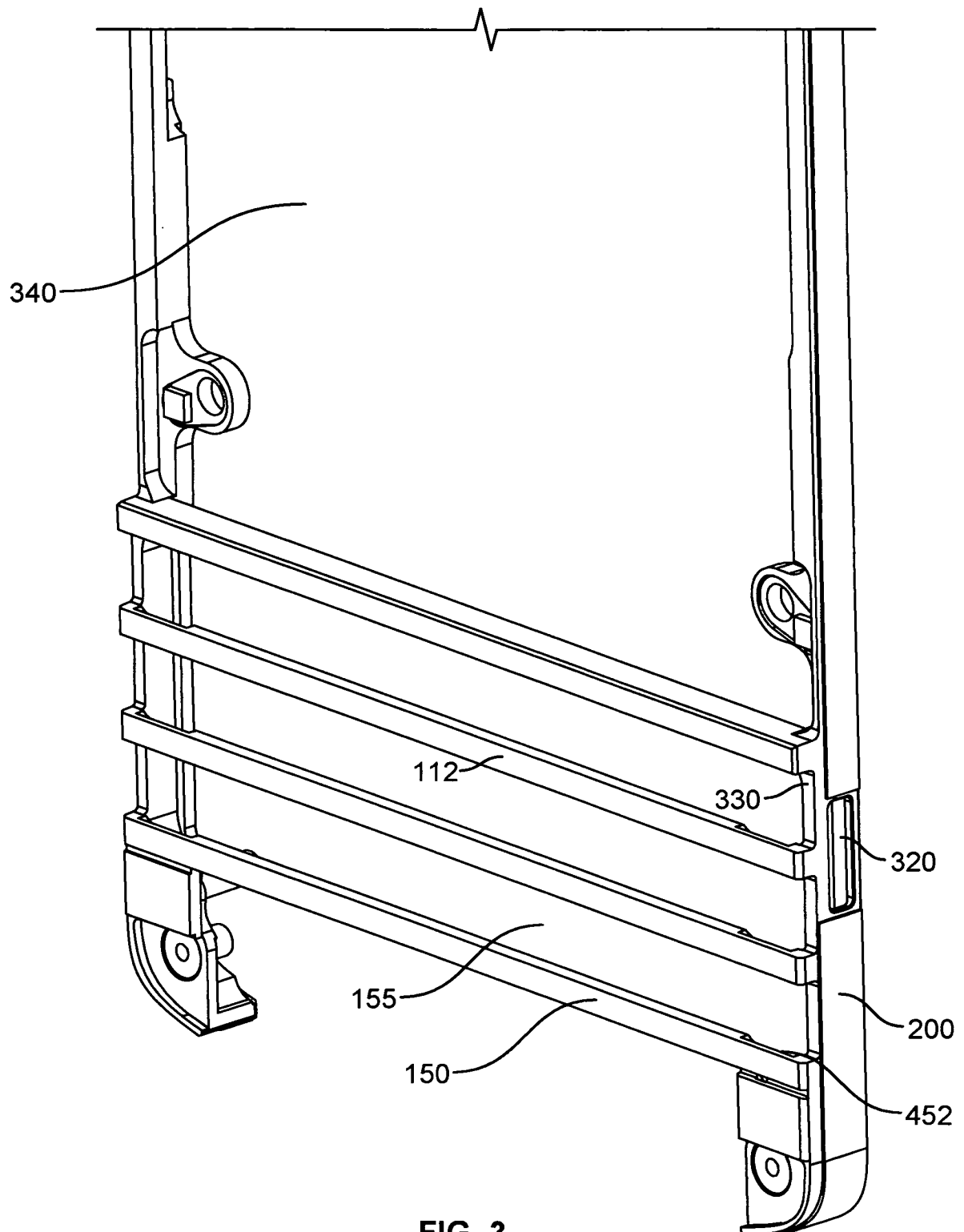


FIG. 2



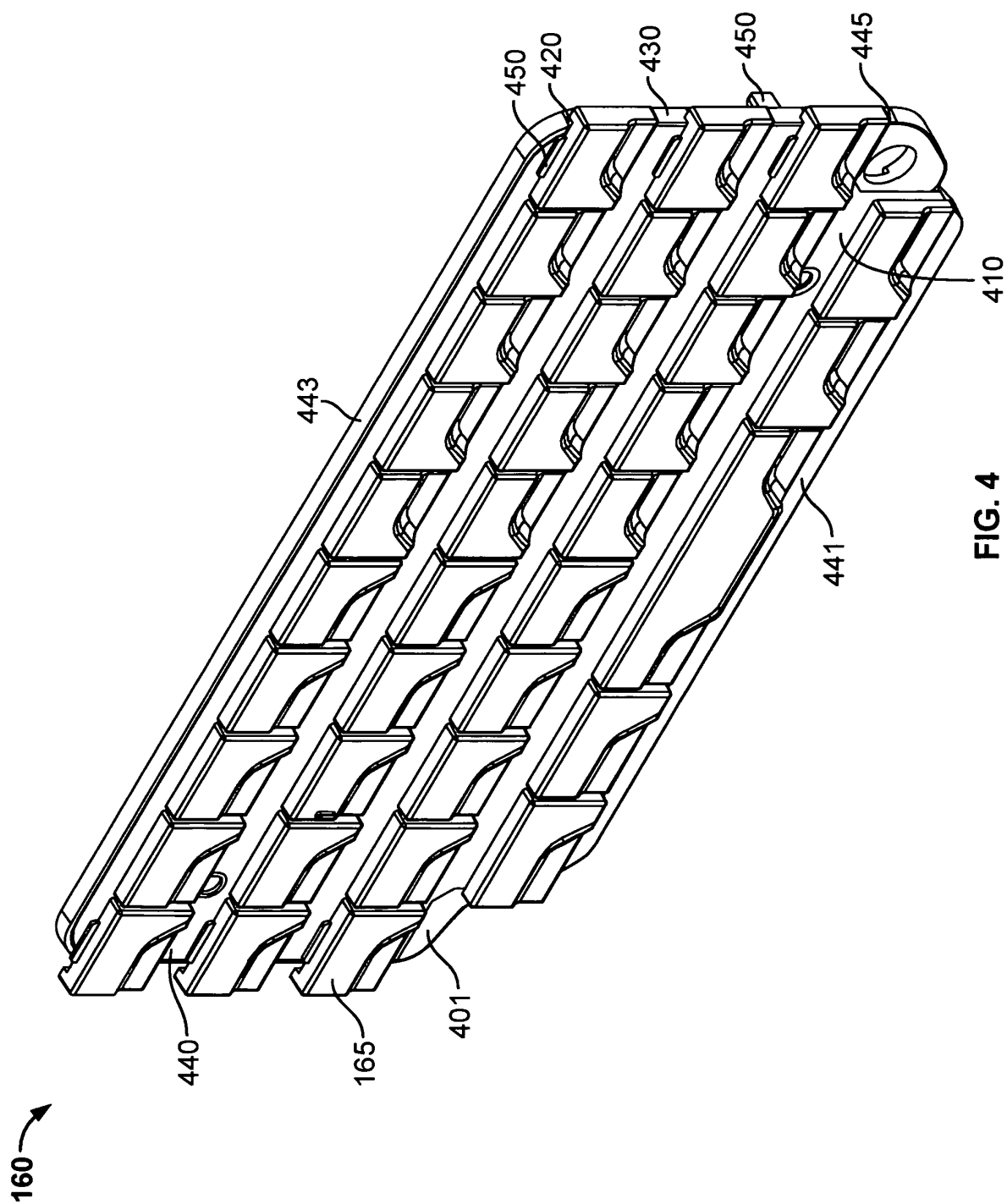


FIG. 4

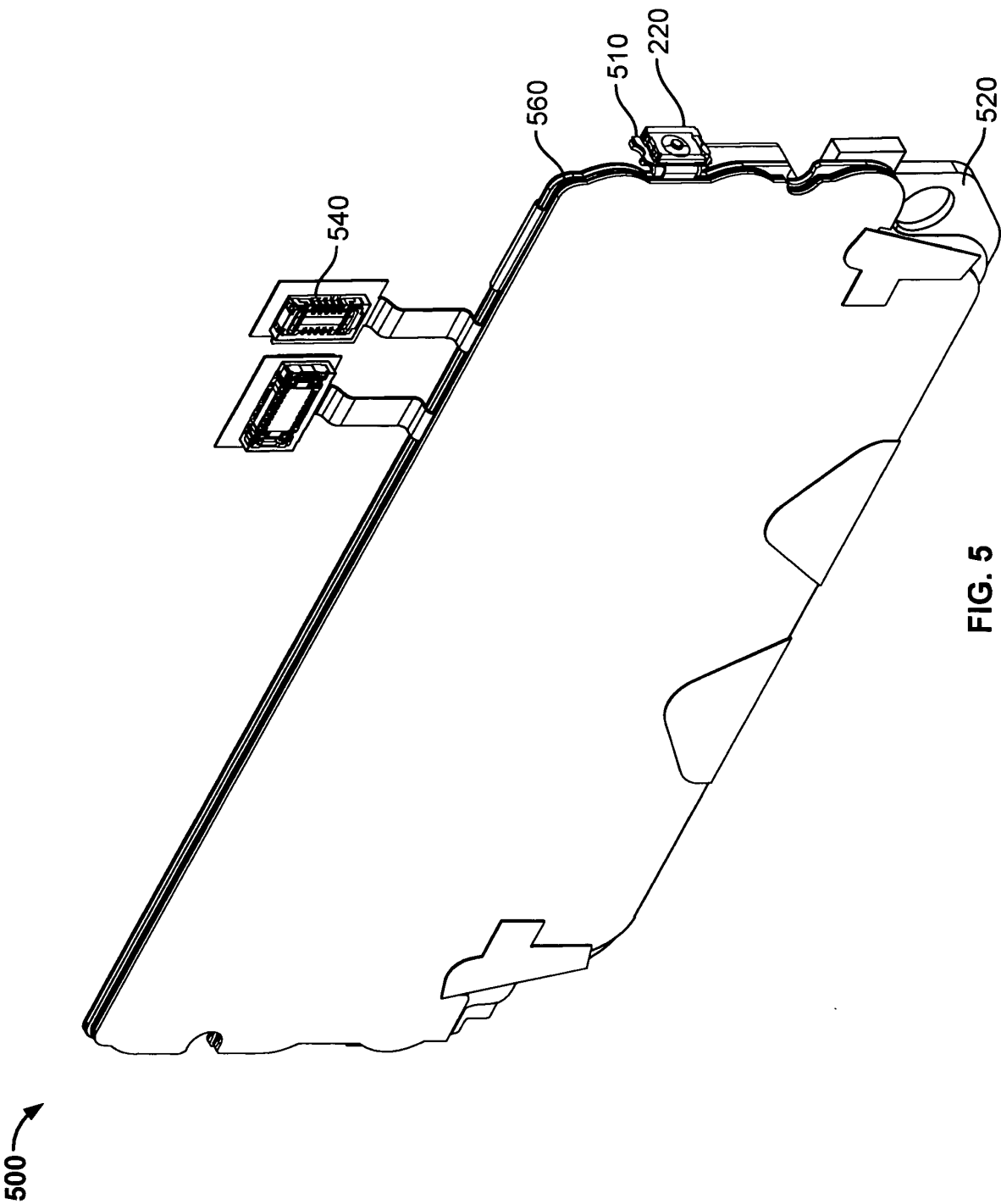


FIG. 5

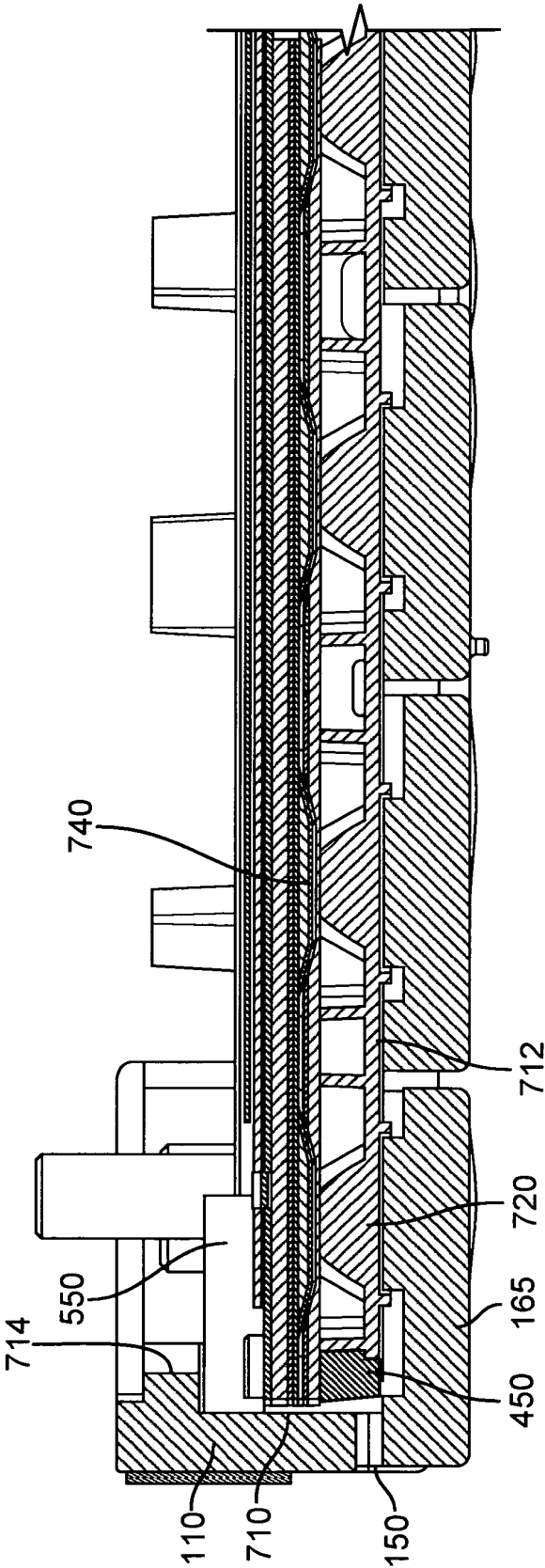


FIG. 6

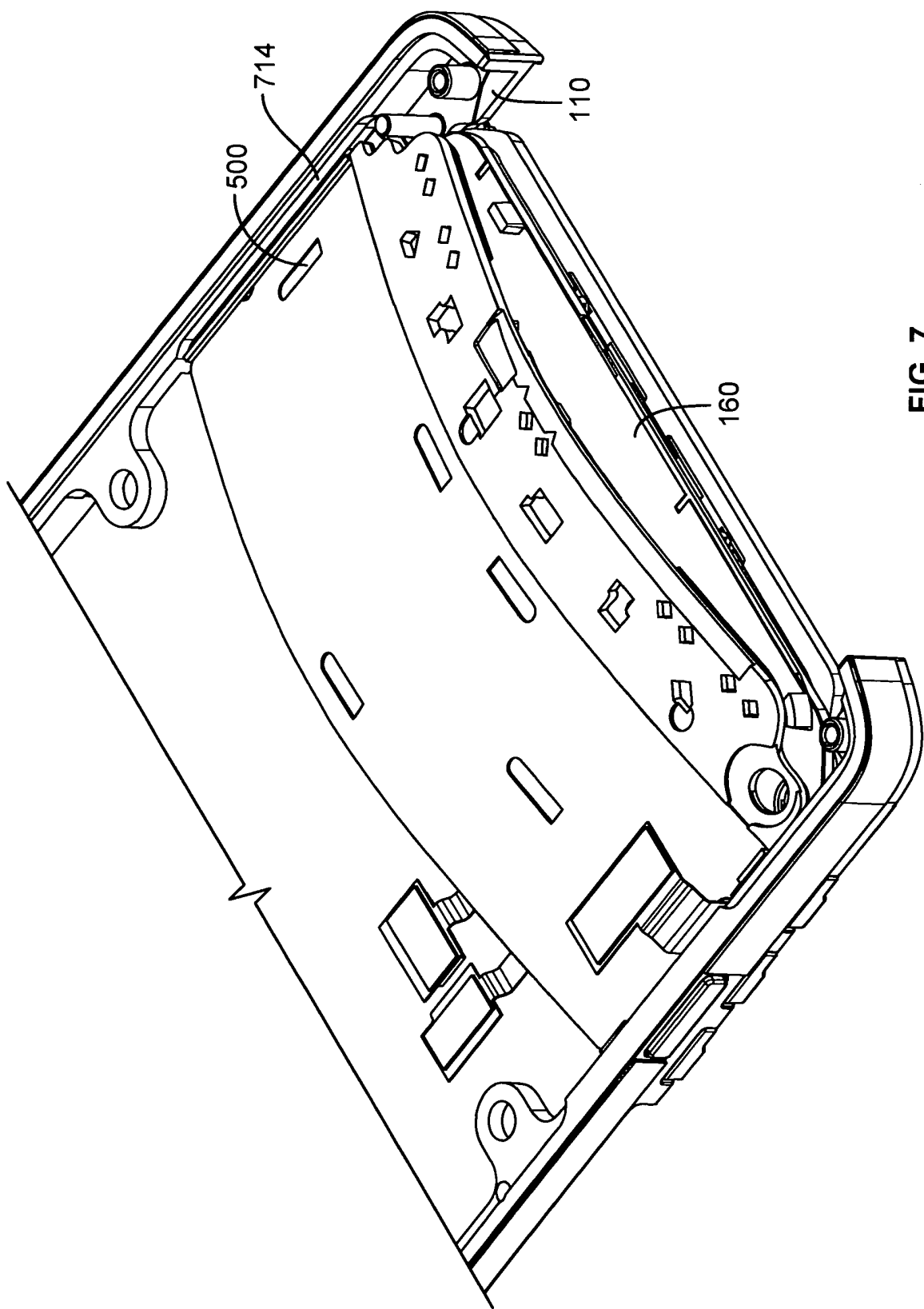


FIG. 7

800

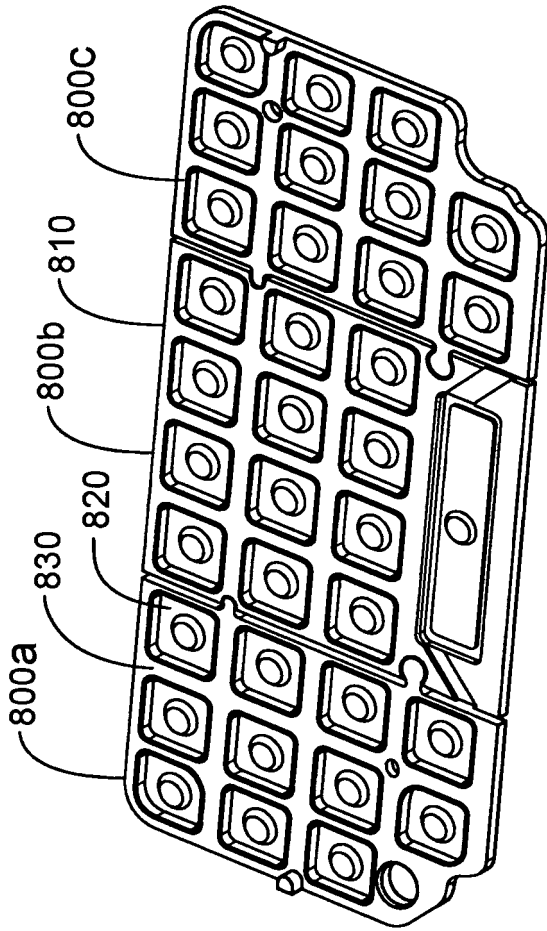


FIG. 8A

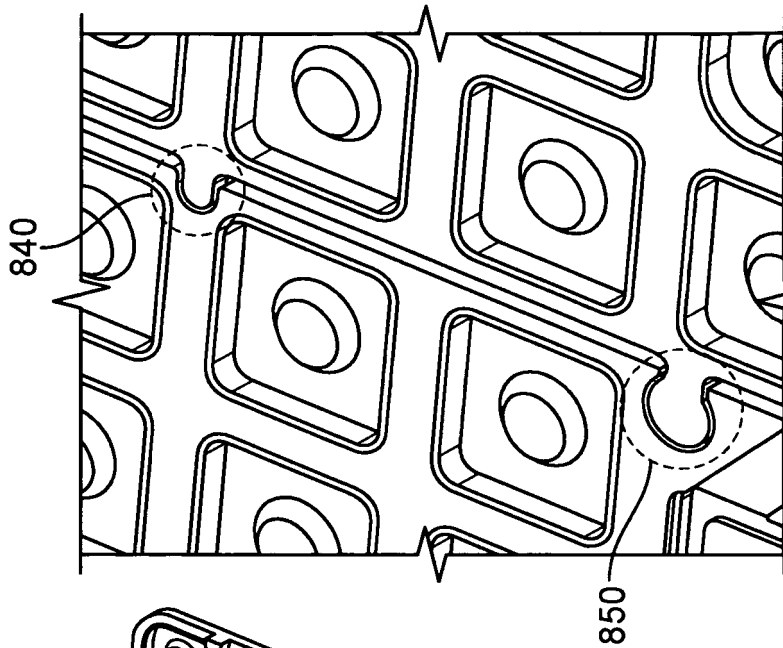


FIG. 8B